

DVB-T Meter

MFK 16



Preface

Dear customer,

KATHREIN-Werke KG has made every effort to ensure the accuracy and completeness of this manual. However, no liability can be accepted for potential errors in this manual or for any resultant loss.

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This manual is subject to modifications and amendments without prior notice. This applies in particular to modifications in line with technical progress.

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General information

The MFK 16 DVB-T signal meter meets the highest quality standards based on its design and highly reliable workmanship. DVB-T signals can easily be measured, as the spectrum is not relevant and there is no need to see a picture on the screen. Also, the signal levels of adjacent analogue channels can be represented with the MFK 16. Additionally, it provides a standard list of all VHF/UHF channels.

This manual tells you how to select the broadcasters covering the individual regions and all the stations they provide.

The manual features the latest available information. You can find the very latest information and updates on the Internet at "www.kathrein.de".

We will in future be making additional region lists available by way of software updates.

Product package

MFK 16 signal meter with integral battery, protective bag and carrying strap



The MFK 16 product package includes:

- MFK 16 signal meter,
- operating manual,
- leather protective bag,
- one BNC/IEC adapter,
- one BNC/F adapter,
- two 10 dB attenuators,
- IEC/IEC measuring cable,
- vehicle battery charger lead,
- mains power cable and
- a computer interface cable for programming.

The mains power cable should be the right one for your region. If it is not, the correct one can be obtained from Kathrein or from a local dealer/importer.

Please keep the original packaging for possible returns.



WARNING: The carrying strap may cause strangulation. Use it only in circumstances where there is no possibility of slipping or tripping.

Safety instructions – important notes

*This page contains important information on operating and connecting up the unit.
Read these instructions carefully before setting up the unit.*



DANGER!

Mains power cable

Make sure that the mains power cable (power supply cable) is not damaged. Units with damaged power cables must be disconnected from the mains power (by pulling the mains plug) and be replaced by a qualified electrician prior to restarting. Use only the power cable supplied!

Risk of death due to electric shock!

Cleaning

Pull the mains plug before cleaning the unit. Only use a dry cloth for cleaning and only clean the outer surface. Never open the unit.

Touching the parts inside the unit carries a risk of death due to electric shock!

Playing children

Ensure that children do not touch any parts inside the unit.

Risk of death due to electric shock!



WARNING!

Mains voltage

Only operate the unit at the specified mains voltage (indicated on the underside of the unit)!

If the mains voltage is too high, there is a risk of fire!

Repairs

Ensure that any repairs to your unit are only carried out by qualified personnel. If you open the unit and attempt to repair it yourself any warranty claims will be voided!

Improper intervention into the unit may place at risk its electrical safety.

The manufacturer shall accept no liability for accidents suffered by the user after opening the unit!



ATTENTION!

Connections

Incorrect wiring of the connections can lead to malfunctions or defects in the unit!

Long periods of absence / storms

Always disconnect the unit from the mains power by pulling the plug if you are going to be away for a lengthy period of time or in a storm.

Damp, sunlight, heat

The unit should be protected from damp, dripping water and splashing. Do not place the unit close to the heating or expose it to direct sunlight and do not operate it in damp locations.

Safety instructions – important notes



- When operated from the mains there is danger to life if the unit is not handled correctly
- Do not expose the unit to dripping or splashing water
- Do not operate the unit in extreme climatic conditions at high humidity levels
- Do not place any containers filled with liquid on the unit
- Keep open flames away from the unit. Do not place lit candles or such like on the unit



Regulation use

The operator must ensure that

- the meter is used only in accordance with its designated purpose
- the meter is operated only if in perfect working order



Mechanical durability

The MFK 16 is designed for mobile use and for the mechanical stresses and strains occurring in such use. The MFK 16 must not be exposed to severe mechanical stress, such as bumping, knocking or dropping, as this may damage it.



The environment

This meter includes a NiMH battery. The battery must not be disposed of in normal domestic waste. Take it to a designated collection point for used batteries.



Electronic equipment is *not household waste*. In accordance with directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 27th January 2003 on used electrical and electronic equipment, it must be disposed of properly.

At the end of its service life, take this unit for disposal at a designated public collection point.

Charging the battery

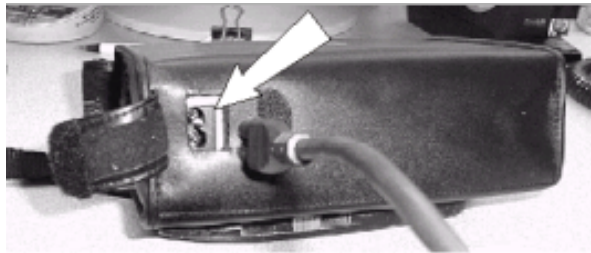
When shipped, the battery is **not** charged. We recommend you leave the battery on charge for **24 hours** before using it for the first time, so that it is fully charged and the state of charge of the cells is equalised. This recommendation also applies if the unit has not been used for a lengthy period of time.

The battery must occasionally be recharged, even if the meter has not been in use. After the battery has been disconnected from the mains power and then reconnected, the battery charge indicator shows 0 %. The correct state of charge is only indicated once it has been charged again.

It makes no difference whether you charge the unit from the mains or in a vehicle.

PLEASE NOTE that it is **not** possible to use the MFK 16 while it is charging.

Charging from the built-in power supply unit



Open the flap on the rear of the MFK 16 to expose the mains power socket. Insert the mains power cable into the socket and plug the other end into a wall socket. The battery is fully charged when the display of the MFK 16 shows "Trickle Charge".

Charging in a vehicle (DC vehicle battery charger leads)



The 12 Volt power socket (12 V DC) is on the right-hand side of the unit. Insert the DC vehicle battery charger lead into the socket and plug the other end into the vehicle's cigarette lighter. Note that in some vehicles the cigarette lighter only carries power when the ignition is switched on.

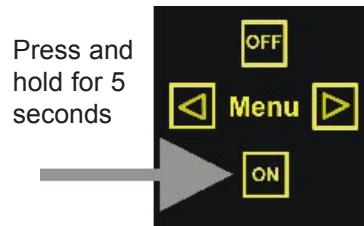
Only the supplied vehicle battery charger lead may be used to charge the unit in the vehicle. Using any other cable may damage the meter and void any warranty claim.

The MFK 16 can be left connected to any of the charging sources mentioned for a lengthy period of time in "Trickle Charge" mode without damaging the internal components or the battery.

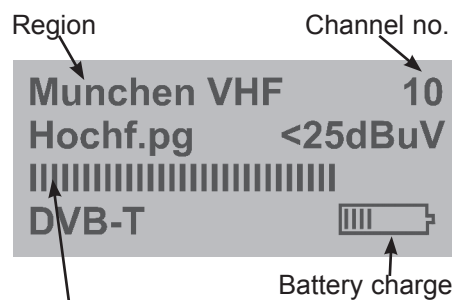
Getting started

Switching on the meter

Connect the MFK 16 input on the front of the unit by a BNC cable to the antenna. Alternatively, you can use the BNC/IEC, the BNC/F adapter and the standard antenna cable (IEC).



The display first shows the version number and the battery state of charge. The meter automatically switches to the next display readout.

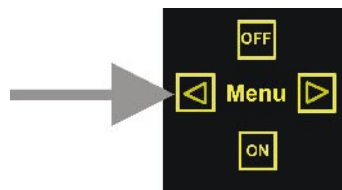


Signal level (RF level) as bar indicator in range 25 to 75 dB μ V with over/under range indicator.

The second display readout indicates:

- the last region selected,
- the channel number,
- the received HF level in dB μ V as a bar indicator,
- the battery state of charge.

Selecting a region



The factory pre-programmed regions enable users to scroll through the channels in their respective region. This means both analogue (in RF level mode) and digital transmissions (in BER mode) can be detected. Each region has more than one transmission channel. Each channel is designated as a MUX (multiplexer). Each MUX transmits multiple stations.

Getting started

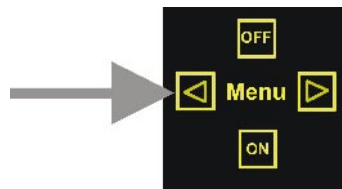
To find the regions you want, scroll through the stored list. To switch regions, press and hold down the right or left arrow button for about 5 seconds.

The meter is factory pre-programmed with the following German regions:

Berlin VHF
Berlin UHF
Bremen/Unterweser
Düsseldorf
Frankfurt VHF
Frankfurt UHF
Hamburg/Lübeck VHF
Hamburg/Lübeck UHF
Hanover/Braunschweig VHF
Hanover/Braunschweig UHF
Kiel VHF
Kiel UHF
Cologne/Bonn
Munich VHF
Munich UHF
Nuremberg VHF
Nuremberg UHF
All VHF channels 5-12
All UHF channels 21-69

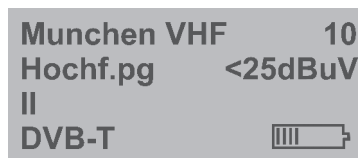
Additional region lists can be obtained as required from the Kathrein website "www.kathrein.de".

Selecting the individual channels



Press and hold down the right or left arrow button for less than 5 seconds to select the various channels.

Selecting different measuring methods



The meter is able to measure the RF signal level (analogue and digital channels), "BER" (Bit Error Rate) as a bar indicator for "Pre BER" and as a numeric value for "Post VITERBI BER". The "BER" can only be measured on digital channels.



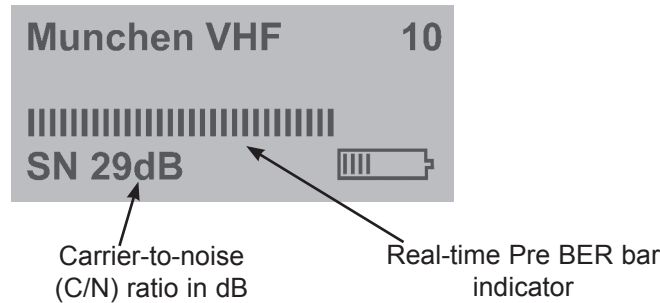
Press the "ON" button to toggle between "RF" and "BER" mode.

Getting started

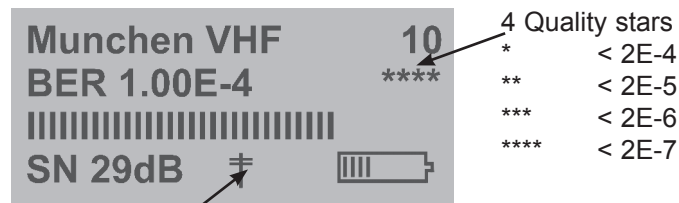
Aligning an antenna / BER mode

Note:

If neither a bar nor DVB-T appears on the display, the signal is too low or the transmission is analogue.



Select a channel and BER mode. For the best result, check each channel in the selected region and set it to the best reception quality, e.g. a peak value on the bar indicator (PRE BER).

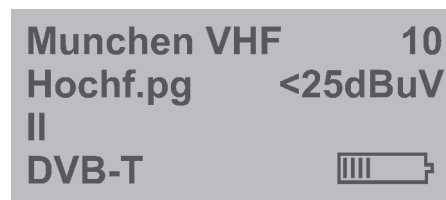


After about 10 seconds the display shows the “Post VITERBI BER” as a numeric value and the quality stars depending on the reception quality.

A BER of 2E-6 or less together with 3 stars (*) is required for satisfactory reception.**

Check ALL channels for optimum reception quality, e.g. signal peaks for the weakest channel.

HF level mode



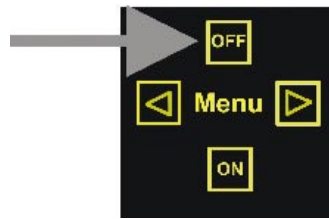
In RF level mode, the meter displays the signal level in dB μ V. For levels below 25 dB μ V the under-range icon appears on the display.



If the meter has captured a digital carrier signal, “DVB-T” is displayed. To make this clear, the acoustic signal changes pitch. If the 75 dB μ V level is exceeded, an over-range icon is displayed. In this case the supplied attenuator must be inserted into the antenna lead (adding the 10 dB to the level then measured).

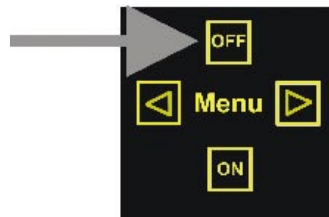
Getting started

Switching off the meter

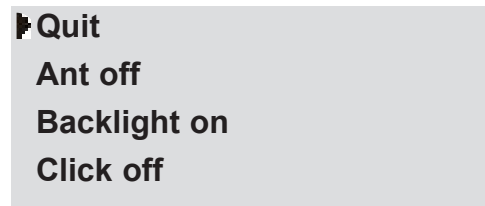


To switch off the MFK 16, press and hold down the “OFF” button for about 5 seconds. The display shows “Power off”, then goes blank.

Selecting setup mode



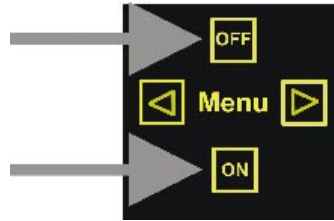
The arrow indicates the selected function.



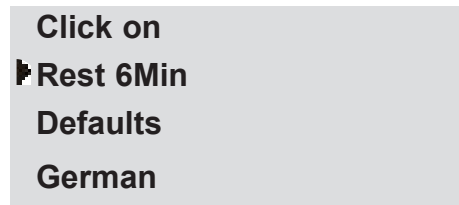
To select setup mode, with the unit **switched off** press and hold down the “OFF” button for about 5 seconds.

Getting started

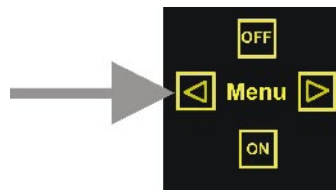
Changing the settings



Timer for automatic power-off selected.



Press the Up or Down button (ON/OFF) to select the required function.



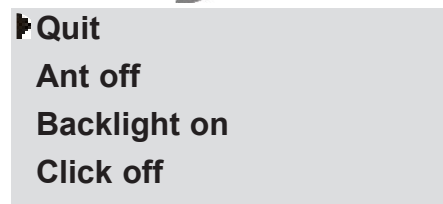
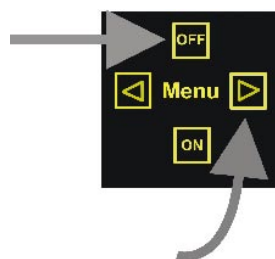
Press the left or right arrow button to change a function.

The cursor indicates the selected function. Press the left or right arrow button to make changes. The display shows the status of the function.

The following functions are available in setup mode:

1. Power supply antenna ON/OFF, e.g. 5 V DC for active antenna
2. Backlighting ON/OFF
3. Acoustic signal on button press ON/OFF
4. "Rest time" (timer for automatic power-off) 0 to 20 minutes, or "Always on"
5. "Defaults". Resets the meter (except for language setup)
6. Languages: German, English, French, Italian and Spanish

Quitting setup mode



Keep pressing the Up button (OFF) until the cursor is positioned on "Quit" and then press the right arrow button.

Technical data

- Display of signal levels of terrestrial signals
 - Display of carrier-to-noise (C/N) ratio
 - BER measurement pre and post Viterbi
 - Memory for 32 different frequency lists
 - 10 frequency lists (City lists) for the individual regions and two master lists (VHF 5-12; UHF 21-69) pre-programmed
 - Problem-free adaptation and modification of frequency lists by software update via RS 232 serial interface
 - Demodulation: COFDM, 2k and 8k mode
 - Channel bandwidth: 7 and 8 MHz measurable
 - RF input range: VHF (Band 3) 167-230 MHz and UHF 470-862 MHz
 - RF input level range: 35 to 75 dB μ V *)
 - RF input socket: BNC 75 Ohm
 - Remote feed (5 V, 150 mA) to active antennas possible via RF input
 - Power supply via built-in NiMH battery 2.4 A/7.2 V
 - Battery capacity for more than 6 hours continuous duty
 - Internal power pack for 100 to 240 V_{AC}
 - External 12 V DC supply
 - Dimensions, L x H x W (mm): 168 x 58 x 123
 - Weight: 0.810 kg
- *) For higher levels the supplied attenuators must be used.

Internet: <http://www.kathrein.de>

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